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December 2004



# RECORD OF DECISION

## Diamond Lake

## Restoration Project

DIAMOND LAKE RANGER DISTRICT

UMPQUA NATIONAL FOREST

DOUGLAS COUNTY, OREGON



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## **Introduction**

This Record of Decision (ROD) documents my decision and rationale for the selection of Alternative 5 to be implemented for the Diamond Lake Restoration Project. The Diamond Lake Restoration Project considers options for improving both the water quality and the recreational fishery at Diamond Lake. There are multiple state and federal agencies that have a role in the management of Diamond Lake. Thus, in addition to management actions that are the responsibility of the Forest Service, there are also accompanying actions that must be accomplished by two cooperating State agencies, the Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Environmental Quality (ODEQ), in order to complete on-the-ground project implementation. Although the Final Environmental Impact Statement (FEIS) for the Diamond Lake Restoration project discloses the potential effects of all proposed activities for each alternative regardless of which agency is responsible, my decision and rationale focus on the actions over which the Forest Service has jurisdiction. Forest Service actions are specified under the purpose and need section of this decision and in several sections of the FEIS and its appendices.

Diamond Lake is a large (3,031 acres), relatively shallow, natural, high-elevation lake. It is located on the Diamond Lake Ranger District, Umpqua National Forest within the Umpqua River Basin. Diamond Lake drains into Lake Creek, which empties into Lemolo Lake, an impoundment on the North Umpqua River. Two other impoundments are located downstream from Lemolo Lake -- Toketee Lake and Soda Springs Reservoir. PacifiCorp, a public utilities corporation, regulates the flow of water from Lemolo Lake and the other impoundments.

Diamond Lake is a high-use recreation area that is important to the economy of southern Oregon. Originally fishless, the lake has been managed as a recreational trout fishery since 1910. Tui chub, a non-native minnow species, were introduced into the lake in the mid-1940's and rapidly overpopulated the lake. In 1954, the Oregon Game Commission constructed a canal near the Lake Creek outlet, lowered the lake level, and treated Diamond Lake with rotenone to eradicate tui chub. The lake was restocked with trout following the rotenone treatment and a thriving fishery was maintained for several decades.

In 1992, tui chub were again discovered in Diamond Lake and have since overpopulated the lake for a second time. As the tui chub population grew during the 1990's, the recreational trout fishery declined dramatically. Now, tui chub are estimated to have an annual population of 7.6 million adults and over 90 million younger fish. This large population has reduced the food supply for trout in Diamond Lake to the extent that the lake is not capable of supporting a quality recreational fishery.

The tui chub population is also negatively impacting water quality at Diamond Lake through its impacts on the aquatic food chain. Diamond Lake has experienced a loss of large zooplankton<sup>1</sup> species over the last decade. Tui chub eat zooplankton. Large

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<sup>1</sup> Zooplankton are very small animals that are suspended in the water column. Freshwater zooplankton are

zooplankton eat phytoplankton<sup>2</sup>, such as the blue green algae, *Anabaena flos-aquae*, which bloomed at Diamond Lake in 2001, 2002, and 2003. The expanding tui chub population has overgrazed large zooplankton in Diamond Lake and effectively eliminated the biological control that previously limited these algae populations. Additionally, the tui chub "add" large quantities of nutrients in the form of excrement that functions as fertilizer for the proliferation of algae.

These negative impacts on the recreational fishery and on water quality in Diamond Lake and down stream prompted multiple local, state, and federal agencies to work cooperatively on solutions for the lake, which ultimately led to formulation of this project.

Initially, an interagency group, referred to as the "Diamond Lake Project Working Group" was formed in October of 2001. The Working Group began implementing an early public involvement process to discuss options for restoring lake health in the fall of 2002. In December of 2002, a formal Memorandum of Understanding (MOU) to cooperate on the restoration of Diamond Lake was signed by 10 individuals and/or organizations that had and continue to participate in the Working Group. From this collaborative effort between the Working Group and interested members of the public a proposed action was developed.

I determined that proposed restoration activities and their effects could best be analyzed and disclosed to the public through an environmental impact statement (EIS) following the National Environmental Policy Act (NEPA). A Notice of Intent (NOI) to prepare an EIS was published in the Federal Register on April 25<sup>th</sup>, 2003. A revised NOI, describing that ODFW and ODEQ would serve as Cooperating Agencies in the preparation of the EIS was published in the Federal Register on November 19<sup>th</sup>, 2003. This was followed by an April 2<sup>nd</sup>, 2004 Notice of Availability in the Federal Register and release of the Diamond Lake Restoration Project Draft Environmental Impact Statement (DEIS). The Final EIS (FEIS) was distributed to the public on November 30<sup>th</sup>, 2004 approximately two weeks prior to this Record of Decision.

## ***Purpose and Need for Action***

Desired conditions for the planning area are described by the various plans, rules, and policies that govern management of the lake.<sup>3</sup> The difference between the existing conditions and the desired conditions defines the purpose and need. In cooperation

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dominated by four major groups: protozoa, rotifers, and two subclasses of Crustacea, the cladocerans and copepods (Mandaville 1997). The larger zooplankton (cladocerans and copepods) are important sources of food for many species of fish.

<sup>2</sup> Phytoplankton are floating plants usually microscopic, comprised primarily of algae that live suspended in the water.

<sup>3</sup> Umpqua National Forest Land and Resource Management Plan (LRMP) as amended by the 1994 Record of Decision For Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (Northwest Forest Plan)(USDA 1990, USDA/USDI 1994); Oregon Administrative Rules (OAR), Department of Environmental Quality, Water Pollution Division 41 State-Wide Water Quality Management Plan; Beneficial Uses, Policies, Standards, and Treatment Criteria For Oregon; (OAR 340-41-0001); OAR Department of Fish and Wildlife, Chapter 635 Mini-Management Plans, Policies, and Objectives, Diamond Lake (OAR 635-500-0703) and Management Alternatives, Basic Yield (OAR 635-500-0115) and Douglas County Comprehensive Plan (Douglas County 2002 ).

with partners on the Diamond Lake Work Group, I established a two-fold purpose and need for this project: 1) improved water quality at Diamond Lake, and 2) an improved recreational fishery at Diamond Lake. Both of these needs for action are responsive to direction established in the 1990 Umpqua National Forest Land and Resource Management Plan for Management Area 2. The need for improved water quality is also responsive to the requirements under the Clean Water Act and the intent of the Aquatic Conservation Strategy (ACS) as described in the 1994 Northwest Forest Plan.

The Umpqua National Forest Land and Resource Management Plan framed the basis for management activities proposed by the Forest Service in the Diamond Lake area. In Management Area 2, the lake is to be managed for concentrated developed recreation, favoring activities such as resort use, camping, picnicking, visitor information services, boating, fishing, interpretation and developed and dispersed winter sports (LRMP 1990, pgs. 110, 153). Summer-time lake closures due to degraded water quality are not compatible with MA-2 goals, are disappointing to summer recreationists, and have negative economic impacts to local businesses.

Additionally, Diamond Lake does not meet State water quality standards or support the beneficial uses of the lake and is currently included on ODEQ's 303(d) list of "water quality limited" water bodies for the parameters of pH and algae. The beneficial uses that are currently negatively impacted by these water quality problems include: resident fish and aquatic life, water contact recreation, aesthetics, and fishing. Based on scientific data assembled by the Diamond Lake Work Group, it was clear that eradication or control of the existing tui chub population is essential for setting the lake ecosystem on course toward a desired future condition of improved water quality that supports the beneficial uses as described by MA-2 goals and State standards.

Similarly, failure of the formerly successful recreational fishery at Diamond Lake is attributed largely to changes in the ecology of the lake caused by overpopulation by tui chub. LRMP MA-2 goals for the Diamond Lake fishery are general in nature and simply identify that fishing is a recreational activity that should be supported through management activities at the lake (LRMP 1990, pgs. 110, 153). The current recreational fishery does not meet ODFW's management objectives for Diamond Lake and many members of the public have expressed dissatisfaction with the existing, depressed recreational fishery at the lake. The desired condition for Diamond Lake is an ecologically sustainable recreational fishery that meets LRMP MA-2 goals and State management objectives. The existing fishery meets neither.

Therefore, I determined there is a need to propose and participate in activities that would support improvement of the recreational fishery at Diamond Lake.

The 1998 watershed analysis (a process required as part of the Aquatic Conservation Strategy of the Northwest Forest Plan) for the Diamond Lake and Lemolo Lake watersheds, provides relevant background information and a landscape-scale context for the project. Recommendations from this analysis regarding water quality and fisheries at Diamond Lake consisted of forecasts for future conditions based on the assumption that ODFW would treat the lake with rotenone and restock with rainbow trout (USDA 1998 pgs. 114, 208).

Completing activities on National Forest lands that would allow application of rotenone in Diamond Lake to remove tui chub complies with direction in the LRMP as amended. It is also consistent with the Watershed Analysis, and moves the existing degraded condition toward the desired condition of a healthy lake ecosystem with greatly improved water quality that also supports an improved recreational fishery.

After the need for action was clearly identified, I established an interdisciplinary team to help me develop a restoration proposal to meet the defined purpose and need. Experts from two Ranger Districts, other Agencies, and noted scientists carried out extensive field reconnaissance, formal inventories, and public involvement in order to develop the proposed action. Once the proposed action was developed, I initiated the NEPA process, including scoping, which continued the extensive public participation effort. In 2003, this cooperation continued with the establishment of the Forest Service as the "lead agency" and ODFW and ODEQ as "cooperating agencies". This formalization in the form of an MOU identified the roles and responsibilities for all agencies party to the MOU.

In brief, the proposed action that was developed included canal reconstruction to facilitate a lake draw down, mechanical removal of fish biomass, chemical treatment of the lake to eradicate tui chub, removal and processing of fish carcasses, restocking the lake with fish by ODFW, a suite of educational and monitoring activities, and contingency measures for controlling tui chub if they are reintroduced to Diamond Lake in the future.

Scoping on this restoration proposal generated a number of potential conflicts over the uses of natural resources, referred to as "issues" in NEPA.

## ***Issues***

In response to the proposed action, the public and the Forest Service identified four significant issues. Significant issues were then used to develop alternatives to the Proposed Action. These issues, found in Chapter 1 on pages 16-18 in the FEIS, are:

### **Fish Stocking**

Some members of the public felt that certain fish stocking strategies, different from past or proposed strategies, may now be appropriate for use in the management of the recreational fishery at Diamond Lake because: they believe past or proposed strategies have and would continue to compromise water quality in the lake; or they believe different fish species would make better predators on tui chub than rainbow trout. They suggested strategies to: change from management under a "Basic Yield Alternative" of the Oregon Trout Plan to a higher priority alternative due to the potential classification of Diamond Lake as a problem water; change in the numeric goals for annual fish stocking and harvest rates; a change to a different fish species mix that could include "Fishwich" rainbow trout, Eagle Lake rainbow trout, Kamloops rainbow trout, Crane Prairie rainbow trout ("Cranebows"), Oak Springs rainbow trout, spring chinook, brown trout, steelhead, Umpqua cutthroat trout, Lahontan cutthroat trout, bass, catfish, whippers, walleye, or northern pike. While different stocking strategies and their effects are discussed in the EIS and in this Decision, the final decision on stocking is under the authority of the State of Oregon.

## **Non-target Species**

Some members of the public expressed a concern that a rotenone treatment would kill non-target fish and wildlife species (i.e. amphibians, macroinvertebrates, rainbow trout) in Diamond Lake and could have negative impacts on other fauna in the Diamond Lake food chain (i.e. bald eagles, waterfowl, river otters). In addition, there were concerns about the potential negative effects on non-target species in Lake Creek, Lemolo Lake, and the North Umpqua River system if rotenone-treated water escaped Diamond Lake through Lake Creek or groundwater.

## **Water Quality**

Some members of the public were concerned about the following potential effects on water quality associated with the proposed action including: effects of the lake draw down on water quality in Lake Creek, Lemolo Lake, and the North Umpqua River; effects of the rotenone treatment on downstream or adjacent water quality (i.e. summer home wells and North Umpqua River), if treated water escaped Diamond Lake through the Lake Creek outlets or the groundwater; and effects of the proposed action (rotenone treatment and fish restocking strategy) on water quality in Diamond Lake proper in both the short and long-term; i.e., the immediate effects of rotenone on the existing condition of water quality in the lake and the long-term effects of the entire proposed action on the future food chain and ecology of Diamond Lake (fish-zooplankton-phytoplankton-water-quality relationship).

## **Wetland Ecology**

Some members of the public expressed concern that the proposed draw down could affect wetlands adjacent to the lake and the flora and fauna species associated with them. In addition, there were public concerns over the potential effects of the draw down on the physical integrity of Lake Creek.

In addition to the above issues, eight additional issues were considered that did not lead to the development of alternatives. These issues and their mitigation, where applicable, are discussed on pages 18-20 in Chapter 1 in the FEIS.

## ***Alternatives Considered in Detail***

Four action alternatives and a no-action alternative were analyzed in detail in the FEIS pages 21-39. Alternatives considered include:

### **Alternative 1: No Action**

No canal reconstruction, lake draw down, mechanical fish harvest, chemical treatment, fish-carcass removal, or lake refill would occur. No active measures to improve water quality at Diamond Lake would be implemented. Potentially harmful algae blooms and lake closures would be expected to continue.

ODFW would continue with the existing experimental fish-stocking program. Based on current knowledge and budget, it is expected that ODFW would stock Diamond Lake with 24,000 legal-sized rainbow trout on an annual basis in 2006 and beyond.

## **Alternative 2: Proposed Action**

The proposed action was developed to meet the purpose and need. This alternative includes the following series of actions that would be implemented by the Forest Service or Cooperating Agencies: a blocked and debris-filled existing earthen canal that connects Diamond Lake to Lake Creek would be reconstructed to facilitate a lake draw down. Diamond Lake's water level would be lowered by eight feet using both the reconstructed canal and Lake Creek for water transport. This gravity-driven draw down would occur in the year prior to chemical treatment at a discharge rate approximating a bankfull flow in Lake Creek.

Several methods (i.e. nets, seines, liberalized catch limits on fishing) would be used to remove fish from Diamond Lake prior to chemical treatment. Fish carcasses would be converted to an organic fish emulsion product on site or trucked to an off-site plant for utilization as fertilizer.

Powdered rotenone (a fish toxicant) would be applied to Diamond Lake in September under conditions considered optimal for achieving a complete fish kill. Sections of Silent Creek and Short Creek would also be treated with liquid rotenone. A project specific, non-significant amendment to the Umpqua National Forest LRMP would be completed to allow the use of rotenone within Diamond Lake, Short and Silent Creeks, which would not normally occur under some Forest Plan Standard and Guidelines. A professional fish mortality recovery and recycling operation would be employed to collect fish carcasses following a chemical treatment of the lake. Fish carcasses would be converted to an emulsion product or fertilizer either on or off-site.

An active water management strategy would be implemented to limit the length of time that Lake Creek is reduced to no or very low flows. Following the rotenone treatment, when lake water becomes suitable for release, canal headgates would be opened to allow approximately 10 cubic feet per second (cfs) of water to flow into Lake Creek. A variety of monitoring activities detailed in Appendix BB of the FEIS would be used to verify assumptions, evaluate project success, and formulate appropriate lake-management strategies.

ODFW would restock Diamond Lake with fish using an ecologically sustainable stocking strategy. They would manage the lake for hatchery production under the Basic Yield Alternative of Oregon's Trout Plan. However, ecological indices of lake health, existing data and knowledge, annual fish-monitoring data and applicable nutrient-loading allocations provided in ODEQ's pending Total Maximum Daily Load (TMDL) publication would be used to determine appropriate numeric goals for annual fish stocking and harvest post-project. Conservatively small numbers of fingerling rainbow trout and legal and/or trophy-sized predacious trout species would be introduced into Diamond Lake as soon as the food chain recovered adequately to support them without compromising progress toward water-quality goals.

A number of educational activities detailed in Appendix BB of the FEIS would be used to reduce the likelihood of tui chub reintroduction into Diamond Lake (i.e. boat inspections, interpretive signs and brochures). Additionally, several other actions detailed in Appendix BB are designed to control tui chub populations if reintroduction occurs in the future (i.e. monitoring for early detection, mechanical treatments).

As a connected action to this alternative, a permit would be issued to Diamond Lake Resort to conduct maintenance and clean-up at the Resort Marina and the South Shore Pizza parlor dock while Diamond Lake is drawn down to eight feet below its normal level.

### **Alternative 3: Put and Take Fishery**

This alternative was developed to address the fish-stocking issue. It was designed to provide a recreational fishery that minimizes potential effects of stocked fish on water quality in Diamond Lake. Alternative 3 is identical to the proposed action except that under this alternative ODFW would utilize a different fish-stocking strategy to restock Diamond Lake following a rotenone treatment.

This alternative addresses fish-stocking concerns by proposing a change from a fingerling-based fish-stocking strategy to a "put and take fishery" where legal-sized fish are stocked in the spring and are harvested by anglers later in the same season. Under this stocking strategy, it is estimated<sup>4</sup> that ODFW would stock Diamond Lake annually with approximately 100,000-400,000 12-inch domesticated rainbow trout. Trout from this brood stock would not reproduce successfully in Diamond Lake, would not prey significantly on available food organisms, and the majority would not survive over winter. Unlike fingerling-sized trout, these legal-sized trout would not feed on zooplankton and thus, would have a very limited impact on the recovering aquatic food chain and related water quality.

### **Alternative 4: Mechanical/Biological.**

This alternative responds to the issues of fish stocking, non-target species, water quality, wetland ecology, and the human health risks associated with rotenone use. This alternative differs from the proposed action in that it does not include a lake draw down so potential impacts to water quality and wetland ecology from a draw down are eliminated; and it does not include a rotenone treatment so potential impacts to non-target species, water quality, and health risks associated with rotenone are also eliminated.

Alternative 4 would use both active and passive mechanical fishing techniques in combination with predacious fish stocking to selectively harvest chub, disrupt chub spawning and increase predation on chub, with the objective of severely diminishing chub populations over time.

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<sup>4</sup> Ecological indices of lake health, existing data and knowledge, annual fish monitoring data and applicable nutrient loading allocations provided in ODEQ's pending Total Maximum Daily Load (TMDL) publication would be used to determine appropriate numeric goals for annual fish stocking and harvest post-project.

This alternative would also use a different fish-stocking strategy than the proposed action. Alternative 4 addresses fish-stocking concerns by proposing a change from a fingerling-based fish-stocking strategy to a stocking strategy that uses large-sized predacious fish. Under this stocking strategy, it is estimated<sup>5</sup> that ODFW would stock Diamond Lake annually with large predacious fish in sufficient numbers and of sufficient size and age classes to serve as potentially effective predators on the tui chub and with enough catchable-sized trout to support an improved recreational fishery.

Alternative 4 was modified between Draft and Final EIS to include changes recommended by several DEIS commenters. All modifications were designed to increase the potential effectiveness of the alternative at achieving and maintaining improved water quality and recreational fishery in the long term. Alternative 4 includes a contingency plan (Appendix CC of the FEIS) that would extend mechanical fishing and predacious fish stocking into the future beyond the seven-year lifetime of the project.

### **Alternative 5: Modified Rotenone Treatment & Post-Treatment Fish Stocking**

This alternative was developed to respond to comments on the DEIS related to the rotenone treatment and the fish-stocking strategy. Alternative 5 is identical to Alternative 2 with the following exceptions.

Alternative 5 differs from the proposed action by using liquid rotenone in the shallow, weedy areas of Diamond Lake. Under the proposed action only powdered rotenone would be used in Diamond Lake proper. Multiple comments on the DEIS documented a concern that the proposed Alternative 2 or Alternative 3 rotenone treatment might not completely eradicate tui chub from Diamond Lake. The modified rotenone treatment described under this alternative is designed to address this concern. Because liquid rotenone disperses more quickly and thoroughly in vegetated environments, expert personnel with the California Department of Fish and Game suggested that use of liquid rotenone in shallow weed beds (optimal tui chub habitat) in Diamond Lake would increase the likelihood that the treatment would kill all of the tui chub present in the lake at the time of treatment.

Alternative 5 also includes the post-treatment fish-stocking strategy described by ODFW after publication of the DEIS. Based on multiple DEIS comments related to fish stocking, the Forest Service requested a letter of clarification regarding ODFW's intended post-rotenone-treatment fish-stocking strategy. This alternative includes ODFW's response to that request. Fish stocking under this alternative is primarily fingerling-based and closely resembles the stocking strategy described under the proposed action. As with all action alternatives, it includes annual stocking with some larger-sized predacious trout and describes that ecological indices of lake health, existing data and knowledge, annual fish-monitoring data and applicable nutrient loading allocations provided in ODEQ's pending Total Maximum Daily Load (TMDL) publication would be used to determine appropriate numeric goals for annual fish

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<sup>5</sup> Ecological indices of lake health, existing data and knowledge, annual fish monitoring data and applicable nutrient loading allocations provided in ODEQ's pending Total Maximum Daily Load (TMDL) publication would be used to determine appropriate numeric goals for annual fish stocking and harvest post-project.

stocking and harvest post-project. Alternative 5 also notes that in compliance with the TMDL's beneficial uses, appropriate stocking numbers and timing of fingerling size fish releases would not occur post-treatment until zooplankton levels and community composition fall within agreed ranges for supporting water-quality recovery and the ecological health of the lake.

## ***Alternatives Considered, But Eliminated From Detailed Study***

Internal and external scoping prompted the exploration of 24 additional alternatives that were considered, but eliminated from detailed study due to prohibitive costs, inconsistency with regulatory requirements, or lack of feasibility or effectiveness. These alternatives are described in Chapter 2 of the FEIS on pages 63-69.

In addition to our traditional scoping efforts, I invited a panel of lake experts from Portland State University, the private scientific community, and members of the public to join IDT members in a two-day meeting to recommend options, review alternatives and to provide rationale for any alternatives that were not considered feasible. Additionally, prior to the initiation of NEPA for this project, the Diamond Lake Work Group convened a technical panel charged with exploring and evaluating all feasible options for the lake. Thus, I am confident that we have been thorough in our efforts to seek out appropriate management options for the lake.

## ***Changes between Draft and Final***

The FEIS contains a number of changes based on comments received during the 45-day comment period, and as a result of other changes in the Federal policy or regulation. The beginning of each chapter in the FEIS summarizes changes that occurred between the draft and final EIS (FEIS pgs. 1, 21, 71-72, 417). Changes in policy or requirements for Forest Service actions included: changes to the Aquatic Conservation Strategy (ACS), elimination of Survey and Manage Species requirements, changes to the status of coho salmon and to the R6 Regional Forester's Sensitive Species list.

Alternative 4 has been modified to include refinements and improvements recommended by some members of the public. In order to accommodate changes in Alternative 4, the project lifetime has been changed from six to seven years for all action alternatives. Appendix BB and CC have been incorporated into the FEIS and include requested additional details on monitoring, contingency plans, and activities designed to reduce tui chub reintroduction potential.

Another important change is that Alternative 5 was added to the Final EIS in response to comments that were made on the Draft EIS regarding the potential effectiveness of the proposed rotenone treatment and in response to clarifications made by ODFW regarding fish stocking following rotenone treatment.

Once I announced that I was adding an alternative to the Final EIS, several people who had been involved in the project since its inception were concerned that this was not

the appropriate course of action. They requested that I instead prepare a Supplemental Draft EIS prior to issuing a Final EIS. I did not prepare a Supplemental Draft EIS for several reasons.

To begin with, there are two reasons (40 CFR 1502.9) that would trigger the need for a supplement. A supplement would be prepared if:

- (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns, or
- (ii) There are significant new circumstances or information relevant to environmental concern and bearing on the proposed action or its impacts.

My first reason for not preparing a supplement is that our analysis concludes that the different rotenone formulation (liquid rather than powder in part of the area) does not represent a substantial change in the proposal or result in substantially different effects. As demonstrated throughout the FEIS on pages 71-463 of Chapter 3, I believe that this change in rotenone formulation will not produce significantly different environmental effects.

I also concluded that the fish-stocking level in Alternative 5 is within the range of stocking levels evaluated in the DEIS. This strategy proposes stocking approximately the same number of fish as Alternative 2. For example, for the first year after rotenone treatment, Alternative 5 is potentially somewhat more conservative in the approximate stocking of fingerlings. Alternative 5 estimates that 50,000 to 100,000 fingerlings would be stocked in the year following the rotenone treatment, while Alternative 2 estimates that approximately 50,000-150,000 fingerlings (DEIS pg. 197) would be stocked. The second year following treatment, Alternative 5 proposes to stock 100,000 to 200,000 fingerlings, while Alternative 2 proposes to stock approximately 200,000 fingerlings the second year following treatment. Finally, although fingerlings are the age-class of fish with the highest potential to impact water quality, a comparison of total fish numbers (fingerlings combined with all other age and size classes), also confirms that Alternative 5 does not exceed other alternatives; this is displayed throughout the FEIS.

There are numerous ways to compare the fish-stocking strategies described under each alternative, but my resource professionals responsible for the preparation of the DEIS and FEIS believe, and I agree, that Alternative 5 falls within the range of impacts described in the DEIS. Similarly, changes in proposed fish stocking under Alternative 4 are also well within the range of stocking levels and impacts described in the DEIS. This slight change in ODFW's proposed fish-stocking strategy does not affect my federal action, nor does it change the anticipated effects from my decisions. Given these conclusions, I do not believe that (i) above is triggered.

My second reason for not preparing a Supplemental Draft EIS is that I concluded that ODFW's clarifying letter did not represent "significant new circumstances or information". The FEIS concludes that all of the DEIS alternatives remain viable, even after receiving the ODFW clarifying letter. In addition, the ODFW information did not cause the Forest to change the effects discussions regarding the alternatives presented in the DEIS. Moreover, I believe the Purpose and Need for the proposal will still be

met by the alternatives in the manner that was disclosed in the DEIS. Because there are no new circumstances or information that would trigger (ii) above, I chose not to prepare a Supplemental Draft EIS.

## ***Decision***

I have decided that active intervention is necessary to address the serious water quality problems and depressed recreational fishery at Diamond Lake. These problems will not go away without intervention. Intervention is necessary to restore the Lake's health by eliminating the tui chub as rapidly and thoroughly as possible. To accomplish this, I have decided to implement Alternative 5.

It would be irresponsible to continue on a course of no action given the costs in terms of lost recreation, lost revenues, and continued health risks to people and animals that use this important lake. In this time of declining Forest Service budgets and workforce, I have had to spend substantial amounts of limited public funds and human resources to monitor toxic conditions, organize lake closures, study the lake's ecological problems, and build public awareness of these serious problems. This has been at the expense of doing other important work here on the Umpqua and other National Forests in this region. Meanwhile, the danger of someone becoming seriously ill from exposure to algae toxins has been looming, and will continue if nothing is done (FEIS p.359-360).

Recreation use has severely declined with angler trips now just a fraction of what they were before the tui chub reintroduction (FEIS p. 382), and use of Forest Service campgrounds is about half of what it was prior to the tui chub population explosion (FEIS p. 380). In 2003, after three summers of temporary lake closures due to toxic algae blooms, the owner of the Diamond Lake Resort reported a crippling revenue decline of \$700,000, forcing the loss of 30 summer jobs, and hindering his ability to make needed facility repairs. In a broader economic context, the three County area surrounding Diamond Lake will experience economic losses of about \$4.9 million from depressed angler spending every year Diamond Lake remains in this condition (FEIS p. 402).

Once I decided that some form of active management was essential, I weighed the pros and cons of each action alternative based on how well they met the purpose and need and how they addressed the significant issues. The following sections include a discussion of those factors and my rationale for selecting Alternative 5 over the other three action alternatives, preceded by a description of the Forest Service's responsibilities under this alternative.

### **Forest Service Actions**

I would like to emphasize that I am only making a decision on actions that are within my jurisdictional authority as the Umpqua National Forest Supervisor. Specifically, my selection of Alternative 5 includes only the following Forest Service actions:

1. Reconstructing the canal;

2. Authorizing ODFW to transport rotenone across and stage application activities on National Forest System lands, and authorizing ODFW to apply rotenone to Diamond Lake;
3. Authorizing ODFW to remove and process fish carcasses on National Forest System lands;
4. Implementing a temporary area closure during rotenone application to protect public health;
5. Modifying an existing special-use permit to allow connected actions during a lake draw down (includes dock area clean up and improvement proposed by owners of the Diamond Lake Resort);
6. Implementing monitoring activities as described in the monitoring section of this ROD; and,
7. Assisting in implementation of educational and other activities designed to reduce tui chub reintroduction potential as described in Appendix BB, Table 1 of the FEIS (FEIS p. Plans-22).

All other activities are the responsibility of other Federal and state agencies and are not a part of my decision. The responsibilities of each agency are clearly stated in the FEIS in Alternative descriptions (FEIS pgs. 21-39), in Tables 1 and 2 (FEIS p. 51) and in more general terms in Appendix A of the FEIS.

## ***Decision Rationale Based on the Purpose and Need***

### **The Need to Restore Water Quality**

Our original proposal to address the need to restore water quality was Alternative 2, which was developed in partnership with an array of stakeholders including scientists, state agencies, and concerned citizens. That original proposed action was used to scope issues which then led to the development of other alternatives, as required by the National Environmental Policy Act. Alternatives 2 and 5 are very similar in their ability to restore water quality. They both apply rotenone and use similar conservative levels of fish stocking to minimize the impact foraging trout fingerlings would have on the recovering zooplankton populations.

Alternative 3 would also apply rotenone, but fish stocking would rely more on larger domestic trout, which have less likely to eat zooplankton that are important to the recovery of the lake's ecosystem and its water quality. Though Alternative 3 would exert slightly less risk to the lake's post-rotenone ecosystem and water quality (FEIS p. 127), I do not feel this small degree of benefit warrants the extra costs of implementing this alternative. Oregon Department of Fish and Wildlife would have to spend about \$2.85 per fish for each of the catchable size domesticated trout, driving the cost of Alternative 3 well beyond that of Alternatives 2 and 5 (FEIS p. 408-409).

An important factor in my selection of Alternative 5 is its specific use of rotenone. Alternative 5 was created after the Draft EIS was issued, in part, due to comments from an expert in the use of rotenone. Brian Finlayson of California Fish and Game has overseen, studied, and published results of several rotenone applications in California. He recommended that in addition to using powdered rotenone in the lake, liquid

rotenone should also be applied in the lake around the shallower fringes where there are extensive mats of aquatic plants. The liquid rotenone is more likely to disperse among the aquatic plants and therefore is more likely to kill all of the chubs. Alternative 5 was built to address these recommendations, and as such, I feel it provides more assurance of our ability to meet the need to restore water quality compared to the other rotenone Alternatives.

As a connected action to Alternative 5, during the time period when the lake is drawn down, I expect to modify the Diamond Lake Resort's special use permit to allow reconstruction and cleanup of lodge facilities and removal of solid waste (silt and trash) from the bottom of Diamond Lake. I believe Alternative 5 is a good choice because it would facilitate these beneficial actions.

Alternative 4 falls short of Alternative 5 because the rate of progress in restoring water quality is expected to occur slowly, over a seven-year period. Moreover, if the tui chub population were to remain in an active-growth mode due to problems with the mechanical and biological controls, the potential to restore water quality would be diminished. Thirteen years of aggressive mechanical harvest of tui chub in Lava Lake on the Deschutes National Forest has failed to result in a significant reduction in the population. This is in spite of the fact that about 10,000 pounds of chub are netted every year in Lava Lake, which is much smaller than Diamond Lake and where chub spawning habitat is limited and well defined compared to the large and dispersed amount of chub spawning habitat in Diamond Lake (Eilers 2004, Lava Lake memo; FEIS pg. 174-175).

In providing the best assurance of long-term water-quality improvement, I find that Alternative 5 best meets the intent of the Aquatic Conservation Strategy of the Northwest Forest Plan. The Diamond Lake Watershed Analysis recommendations were reviewed and incorporated as applicable. Alternative 5 is consistent with riparian reserve standards and guidelines because, as displayed throughout Chapter 3 of the FEIS, Alternative 5 is designed to contribute to restoring the Diamond Lake 5<sup>th</sup> field watershed over the long term. Though Alternative 5 will result in short-term impacts to the aquatic environment due to the draw down, rotenone application, and equipment work on the lakebed, its long-term beneficial effects to riparian resources contribute positively toward meeting ACS objectives (FEIS p. 87-88).

### **The Need to Restore the Recreational Fishery**

Alternative 5 does a good job of improving the recreational fishery at Diamond Lake. As the recreational fishery improves, the social and economic benefits associated with a robust fishery will also return to the area. Though Alternatives 3 and 4 would also improve the fishery in Diamond Lake compared to the present situation, these Alternatives would be much more costly to implement (FEIS p. 408-409) and they would not perform as well as Alternative 5 in terms of providing the high angler success numbers (FEIS p. 56). Though Alternative 2 is the same as Alternative 5 regarding projections for annual angler catch rates, implementation costs would be slightly less than Alternative 5. However I have chosen Alternative 5, over Alternative 2 in large part because it is the alternative that I feel is most likely to successfully eliminate tui chub. And further, as I describe below, Alternative 5 is preferred by

ODFW, the agency that is responsible for rotenone application and for managing the recreational fishery.

## ***Decision Rationale Based on the Significant Issues***

### **Issue 1 - Fish Stocking Strategy**

The concerns surrounding the fish-stocking strategy sparked more controversy than any other. Although final selection of a fish-stocking strategy rests with ODFW, I am describing the strategy selection rationale here because it is so important to the public. Under Alternative 5, the stocking strategy is nearly identical to that proposed under Alternative 2, with only minor differences in the range and types of fish that are predicted by ODFW to be stocked in the years following rotenone. Many public meetings were held and letters received where the stocking strategy emerged as an issue of central concern.

Many people felt that the fish-stocking strategy used by ODFW after a rotenone treatment would jeopardize the lake's recovery if done too soon, or with too many fish, or the wrong type of fish. People were concerned that the stocked fish, particularly the fingerling-sized fish would eat too many of the aquatic organisms that are critical to sustaining the lake's ecological balance. There were also concerns that Oregon Fish and Wildlife Commission should proceed with approval of the post-rotenone fish-stocking strategy prior to my issuance of this Record of Decision. Still other commenters felt that the concerns over fish stocking were unfounded, that enough time and money had been lost in the absence of a healthy recreational fishery, and that the fishery should be put back in place as soon as possible.

Several commenters also asked for more detail and assurance that the stocking strategy would be properly evaluated and adapted, as necessary, once stocking resumed after rotenone. Thus, in October 2004, the Diamond Lake Working Group established a more specific adaptive-management approach to fish stocking after rotenone; this is spelled out in the Diamond Lake Restoration Monitoring Plan (Appendix BB to the FEIS). I feel that the FEIS monitoring plan is an important addition made at the request of commenters. Additionally, as reflected in the Alternative 5 description (FEIS pg. 39) both the Oregon Departments of Fish and Wildlife and Environment Quality have agreed that in compliance with the pending Total Maximum Daily Load (TMDL) allocation for Diamond Lake, fingerling-size fish releases would not occur after the rotenone treatment until zooplankton levels and community composition fall within agreed ranges for supporting water-quality recovery and the ecological health of the lake. Those ranges will be based on the scientifically derived work of an independent lake scientist. Once formalized in the final TMDL (scheduled for release in March 2005), compliance with nutrient allocations for fish stocking will be a matter of law. As such, I feel that the uncertainty surrounding the issue of fish stocking has been alleviated by both the formal adoption of this scientifically based feedback loop during post-rotenone stocking and the legal requirements of the upcoming TMDL.

I also believe the data we have from the post-rotenone stocking in the 1950's provide a valuable context for what we do at Diamond Lake today (Eilers presentation, 9-20-04

meeting notes). In 1954, 500,000 fingerlings were stocked in the first year following rotenone treatment and 1 million fingerlings were stocked in the second year. The fingerling-sized fish are of most concern for over-grazing the native zooplankton populations, which will need to recover after a rotenone kill. Under the aggressive fingerling-stocking program used after the 1954 Diamond Lake rotenone treatment, lake recovery was very rapid (FEIS page 206, 09-20-04 meeting notes). By comparison, under Alternative 5, ODFW predicts that only about 50,000 to 100,000 fingerlings will be stocked during the post-treatment year, followed by an estimated 100,000 to 200,000 fingerlings the following year. The conservative strategy under Alternative 5 of stocking only a fraction of the fish that were stocked following the 1954 treatment provides an ample margin of safety to achieve a rapid lake recovery.

One of the reasons I chose Alternative 5 for the Forest Service portion of this decision is that it best reflects the desires of the Oregon Department of Fish and Wildlife, the agency with the most expertise in these matters. Moreover, since fish stocking is within the state of Oregon's jurisdiction and authority, they are ultimately responsible for the selection and implementation of the stocking strategy after the rotenone treatment. The variety of stocking strategies described under the FEIS Alternatives are over-all strategies or predictions, the details of which must be worked out under the State's statutory authority including public review.

I know that the Director of Oregon Department of Fish and Wildlife, Lindsay Ball, and his staff are fully committed to implementing an ecologically sound fish-stocking strategy (Letter 77, FEIS Appendix AA). Based on that commitment, along with the conservative stocking approach outlined in Alternative 5, our scientifically based adaptive-monitoring approach, and the commitment of our other partnering Agency, Oregon Department of Environmental Quality (Letter 78, Appendix AA), we have established an effective safety net to protect the lake from ecological problems that could develop from fish stocking. Thus, I see no need to delay implementation of this restoration effort until the Fish Commission approves a new fish-stocking strategy.

Our "safety net" would have also protected the lake against potential ecological problems with fish stocking under Alternatives 2 and 3, which would have also applied rotenone followed by different fish-stocking themes. However, I chose not to select either of these alternatives, in part, because they did not reflect the wishes and needs of the state agency with the jurisdiction and authority to actually implement the stocking. Furthermore, based on the safety net concept I have described above, I do not believe there would be any detectable or truly meaningful differences between the stocking strategies under Alternatives 2, 3, and 5 with regard to attainment of our improved-water-quality objective. Alternative 4 addressed some public's concerns with ODFW's fish-stocking strategies. However, I did not select this alternative, which would have applied biological and mechanical tui chub controls, due to: the uncertainty involved in whether we could effectively remove 90-95% of the spawning tui chub each year, the uncertainty regarding whether this alternative would result in desired water quality improvement over time (Eilers 2004, Lava Lake memo; FEIS pgs. 174-175) and the additional time and expense (FEIS pgs. 52-55, 408-409) associated with attempting this approach. I simply did not want to take these chances nor make such an investment of extra time and money with so much presently at risk at Diamond Lake.

## Issue 2 - Non-target species impacts

Alternative 4 was developed, in part, to address the issue of non-target species impacts from chemicals, by using mechanical and biological controls of tui chub instead of rotenone. I did not choose Alternative 4 because, in part, it would exert more long-term impacts on fish and wildlife species due to the potentially longer-term exposures to toxic algae blooms, longer-term stress to species from the disturbances of mechanical chub controls, and the longer recovery time for restoration of a healthy aquatic food chain and prey base for some species (FEIS pgs 294-351). Though Alternative 5 would kill all the desirable trout and other gill breathing organisms in Diamond Lake, it would more rapidly curtail the risk of toxic algae blooms imposed on a broad spectrum of wildlife (FEIS pp 294-296), affording a quicker return to healthy habitat conditions for multiple species compared to that of Alternative 4.

Moreover, when it comes to causing harm to non-target wildlife species, rotenone is relatively benign. The concentrations of rotenone that would be used under the three rotenone alternatives (Alternatives 2, 3, and 5) are only toxic to gill-breathing organisms such as fish, aquatic insects, and some life stages of amphibians. Due to the timing of rotenone application and the life histories of the resident amphibians, very little impact to those species is expected (FEIS p. 298). With the exception of the above species groups, no other wildlife species would be harmed as a result of rotenone exposure.

Wildlife species such as bald eagles (FEIS p. 304-310) that eat fish or species such as waterfowl that eat aquatic insects would temporarily lose their prey base under the rotenone alternatives. However, all practical mitigations, such as a supplemental feeding program for eagles (FEIS p. 47) will be implemented to reduce these impacts to the greatest extent possible. There would also be short-term impacts to wildlife species and habitats associated with the temporary dewatering of Lake Creek and potential disturbance associated with canal-reconstruction activities. However, both the project design features and the mitigation measures that go with Alternative 5 (FEIS p. 47) lessen the drawdown and other associated impacts to all practical extents. Finally, since no rotenone would escape downstream (FEIS pgs.138, 263), no additional impacts to any downstream wildlife, including fish and aquatic organisms, will occur under the rotenone alternatives. Since Alternative 5 is essentially no different from Alternatives 2 and 3 with respect to non-target species, I chose Alternative 5, because with its superior rotenone-treatment plan, it is expected to be more effective at meeting the purpose and need than the other two chemical application alternatives.

Thus, I have chosen to implement Alternative 5, with its short-term trade-off of killing gill-breathing aquatic life in Diamond Lake in exchange for the relatively rapid and reasonable expectation of providing a healthy lake ecosystem for a multitude of species over the long-term. I believe this approach best meets the needs of visitors to the Umpqua National Forest and is the responsible thing to do.

## Issue 3 - Water Quality

This broad-ranging issue played an important role in my decision. People's concerns regarding the effects of rotenone on water quality ranged from rotenone's effect on the lake water and the lake ecosystem, to ground-water contamination with rotenone,

and downstream effects of rotenone in places like Lemolo Lake and the North Umpqua River.

Alternative 4 was developed, in large part, to address concerns over the use of rotenone by using other means of controlling tui chub. Unfortunately, the tui chub population has been out of control for too long, and the toxic algae blooms, created as a direct result of the tui chub population explosion, have reached crisis proportions. I chose not to gamble on Alternative 4 because I wanted to begin alleviating our critical water-quality problems and the associated human-health risks as quickly as possible. Alternative 4 is not a quick solution and it involves too much uncertainty about the likelihood of effective results. I am not convinced that the expensive, and largely experimental control techniques of Alternative 4, would effectively remove 90 to 95% of spawning-age tui chub for 6 consecutive years. Since the success of Alternative 4 hinges on this assumption, I am not willing to take such a risk. Additionally, as referenced earlier, preliminary data from neighboring Lava Lake indicate that even with long-term and highly effective annual mechanical removal of tui chub, toxic algae blooms still occur and the tui chub population appears to continue active growth. This information compounds the level of uncertainty associated with Alternative 4. Given the ecological, economical, and recreational values that are at stake, I consider the high risks associated with Alternative 4 to be unacceptable for Diamond Lake.

By contrast, I chose a rotenone alternative because I have more confidence in this type of solution (FEIS pgs. 174-175, 222, 231, 06-24-04 Finlayson meeting notes). And just as important, the extensive analysis in Chapter 3 of the FEIS reveals that the overall risks of implementing a rotenone alternative, in terms of water quality, are fairly benign, especially over the long-term.

Given the safeguards that are built into Alternative 5 through both project-design features and mitigation measures, I believe that the transport and storage of rotenone on National Forest Lands will be quite benign. I am also confident that rotenone will not escape in any surface waters to affect downstream water quality (FEIS pgs. 137-138). This is because the lake level will be substantially below the level of the outflows (Lake Creek and the canal), the headgates on the outflows will be securely closed when rotenone is applied, and thus there will be no avenue for surface-water escape. Our extensive ground-water studies have also addressed the concern over downstream ground-water contamination of Lake Creek and Lemolo Reservoir (FEIS pgs. 257-263). Based on those studies I conclude that rotenone application in Diamond Lake represents a negligible risk to all downstream water bodies (FEIS p. 263). The concern over rotenone contamination of domestic wells has also been thoroughly investigated (FEIS p. 257-268). There is a slight chance that some of the shallow wells on the west side of the lake would receive very low, but detectable levels of rotenone from the ground water for up to two months following the application of rotenone. The Forest Service will supply bottled water to users of those west shore wells if monitoring shows any chance of contamination (FEIS p. 46).

The lake drawdown will send nutrient-rich waters (enriched by the abundance of tui chub) downstream to Lemolo Reservoir. Yet the downstream effect is predicted to be benign. By design, the nutrient release would occur primarily during the fall and winter months when delivery of nutrient rich waters are not a concern (FEIS p. 148),

and when the nutrients will be diluted and mixed in Lemolo Reservoir by normal winter run-off before entering the North Umpqua River.

Finally, the combined effects of the rotenone, the release of nutrients associated with decomposing fish carcasses, and the expected increase in algae abundance during one spring and summer following rotenone treatment would result in greatly compromised water quality in Diamond Lake in the short-term. Again, this will be a temporary situation that will be alleviated as the rotenone naturally breaks down, the lake refills, fish decomposition ends, and the zooplankton populations recover (FEIS pgs. 115-121).

I am fully aware of the risks of using rotenone on water quality. Because these risks are relatively short-term and benign, and because mitigation measures are in place, I feel the benefits of using rotenone far outweigh the long-term risks of doing nothing (Alternative 1), or experimenting with mechanical and biological controls (Alternative 4).

The three rotenone-application alternatives are very similar in their short-term water-quality impacts, so I have chosen Alternative 5 over Alternatives 2 and 3 based primarily on the fact that Alternative 5 will be more effective at meeting the long-term needs of restoring the lake's water quality and recreational fishery as described earlier in this Decision.

#### **Issue 4 - Wetland Ecology**

Concerns were raised over the effects of the lake draw down on both wetland ecology and stream ecology. The 135 acres of wetlands found on the lake's south shore will be temporarily dewatered during the time when Diamond Lake is partially drained and until it naturally refills (possibly by the summer following rotenone application, depending on precipitation levels). Concerns for the wetlands paralleling Lake Creek plus the stream ecosystem of Lake Creek were raised because Lake Creek will be affected by more than the typical amount of flow while the lake is draining. Subsequently, there will be a period of time when portions of the creek will have no stream flow or low stream flow from Diamond Lake until the rotenone has dissipated and the lake refills to the level where it can naturally flow out Lake Creek.

Alternative 4, which would not have drawn down the lake, was developed, in part, to address the concerns over the impacts of a draw down. However, as I have described above, I have chosen not to implement Alternative 4 because of uncertainties about its effectiveness in achieving the objectives of improved water quality and an improved recreational fishery.

All aspects of this issue were thoroughly analyzed in Chapter 3 of the FEIS. Based on the FEIS analysis of this issue as summarized below, I believe that the overall long-term benefits of implementing Alternative 5 far outweigh the short-term impacts to wetlands and stream conditions.

Negative impacts to the wetlands, such as drying and desiccation of wetland plants, due to the lowering of the water table, are expected to be short-term (FEIS p. 291) with limited risk of long-term negative cumulative effects (FEIS p. 294). In making my

decision to implement Alternative 5, I considered the anticipated low intensity of wetland impacts plus the primarily short-term nature of the impacts. These trade-offs were overshadowed by the improved long-term ecological health of the lake I expect under Alternative 5. The mitigation measures to monitor and re-establish amphibian and rare snail populations (FEIS p. 47) and add water to a sensitive moss species (FEIS p. 50), if necessary, adds extra safeguards to Alternative 5.

As documented in the FEIS, the dewatering of Lake Creek is not expected to impair the long-term integrity of the stream (FEIS p. 136-137). Only about 1,400 feet of the creek will experience a dewatered condition for about 12 to 18 months; while a 5.5-mile reach of Lake Creek will experience much lower than normal flows for about 2 months when only other tributary streams will contribute flow to Lake Creek. The intensity, magnitude, and duration of such stream dewatering will not result in irreversible impacts to this stream.

Likewise, the higher than normal flows, which will typically be "bankfull" flows in Lake Creek will last about 8 months from fall through spring. Flows of this sort in the High Cascades lack the flow energy to move existing in-stream wood, which will function as a stabilizing influence during the draw-down flows (FEIS 129-130, 163-164). Because the bankfull flows are expected to deliver a relatively small volume of new sediment into Lake Creek from fluvial erosion, this is not predicted to result in any appreciable channel changes (FEIS p.163). Moreover, since the substantially greater flows that occurred during the shorter, more intense draw down in 1954 did not change the channel location, the lesser flows under Alternative 5 will not either (FEIS p.164).

Again, I have decided to make these relatively minor, short-term trade-offs in Lake Creek in order to gain substantial ecological benefit, afforded by Alternative 5, to many habitats and species now diminished due to extreme water quality and aquatic community impacts caused by the tui chub population explosion.

## ***Cumulative Effects from Ongoing and Proposed Activities***

In deciding to go forward with Alternative 5 of the Diamond Lake Restoration Project, I reviewed the other past, present, and proposed activities within the entire Diamond Lake Fifth Field Watershed and in Lake Creek, Poole Creek, and Calamut Lake Sixth Field Subwatersheds of the Lemolo Lake Fifth Field Watershed. I also considered activities whose influence may extend downstream of the project area boundary through the North Umpqua River system as far as Rock Creek (FEIS, p. 72-83). Of concern is how these actions may cumulatively affect water quality, fish habitat, and listed or sensitive species. During the analysis, I directed the IDT to consider the likely effects of past, present, and future activities in combination with the proposed activities of the Diamond Lake Project. The thorough analysis of effects (FEIS, Chapter 3) did not indicate likely significant cumulative effects.

## **Other Future Considerations**

In spite of all the educational and regulatory safeguards built into this project with the tui chub reintroduction-prevention plan (FEIS Appendix BB p. 21-23) reintroductions at some point in the future may be likely. Public input during the Draft EIS comment period prompted additional analysis and the further development of a contingency plan to deal with a reintroduction. Many people believe tui chub will eventually be reintroduced in Diamond Lake. I want to acknowledge that if or when tui chub are reintroduced, our goals of sustaining excellent water quality and a robust fishery will once again become compromised. Additional analysis and disclosure regarding such a reintroduction over what was in the Draft can be found throughout the FEIS. The comments we have received from the public have resulted in a better, more thorough finished product. At this time, this is the best we can do. Our Federal environmental decision-making law (NEPA) does not allow me to sanction another rotenone application in future years nor would I presume to know that this option would be the public's choice. Should a chub reintroduction occur, another planning and decision-making process would begin. I believe that vigilant adherence to the measures developed in the chub reintroduction-prevention plan will certainly help lessen the chances of reintroduction.

Both budgets and workforce limit governmental agencies in our ability to control lake users who might intentionally or accidentally cause a tui chub reintroduction. The users of Diamond Lake will have an opportunity to contribute to future prevention efforts by actively helping to spread the word and seeing that other users around them are also following the precautions posted at boat launch sites. We will all share the responsibility for the future of Diamond Lake.

## ***Consultation with USFWS and NOAA***

The U.S. Fish and Wildlife Service (USFWS) completed a Biological Opinion (BO) for the Diamond Lake Restoration Project on April 16, 2004. The Biological Opinion covers the Northern Spotted Owl and the Northern Bald Eagle meeting all requirements under Section 7 of the Endangered Species Act. The findings of effect for the Northern Spotted Owl, and Northern Bald Eagle were not likely to adversely affect and likely to adversely affect, respectively (FEIS pgs. 304, 310).

NOAA Fisheries completed a Letter of Concurrence (LOC) for the Diamond Lake Restoration Project on June 2, 2004. The letter documents NOAA Fisheries' concurrence that the project is not likely to adversely affect the Oregon Coast coho salmon, currently proposed for listing under the Endangered Species Act. The issuance of the LOC by NOAA completed our obligations under Section 7 of the Endangered Species Act.

NOAA Fisheries also concluded that the conservation measures built into the Diamond Lake Restoration Project are adequate to avoid potential impacts to essential fish habitat under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Thus NOAA provided no additional conservation recommendations and consultation under the MSA is complete.

Documentation of these consultations is found in USFWS BO #1-15-04-F-0240 and NOAA Fisheries LOC #2004/00593. Both of these documents are included in the Project Record.

## ***Finding of Forest Plan Consistency and Finding of Forest Plan Amendment Non-Significance***

This decision tiers to the Umpqua National Forest Land and Resource Management Plan (Forest Plan, 1990). I have ensured that the decision is consistent with LRMP objectives and standards with the enactment of the project-specific Forest Plan Amendment.

Under Alternative 5, the Forest Service would authorize the application of rotenone to Silent and Short Creeks and to Diamond Lake, which would be in conflict with two standards and guidelines and one riparian prescription in the Umpqua National Forest Land and Resource Management Plan (LRMP). Standard and Guideline Fisheries #6 (LRMP IV-33), Water Quality/Riparian Areas #8 (LRMP IV-60), and Prescription C2-1 (LRMP 169-171) state that pesticides will not be applied in riparian units of fish-bearing streams, lakes, and ponds. Therefore, this decision includes a one-time, project-specific Forest Plan amendment in order to implement Alternative 5. Pages 237 and 238 of the Diamond Lake FEIS document the specific impacts of enacting this amendment.

FSH 1909.12, section 5.32 (in italics below) outlines the factors to be used to determine whether a proposed change to the LRMP is significant or not significant, based on NFMA requirements. A discussion of each of these four factors follows.

1. *Timing. Determine whether the change is necessary during or after the plan period. In most cases, the later the change, the less likely it is to be significant for the forest plan.* The amendment is necessary now in order to authorize the application of rotenone to Short Creek, Silent Creek and Diamond Lake; this authorization would occur at the end of the current plan period (plan revision is scheduled to be initiated in 2007/2008). Therefore, timing is not considered to be a significant factor related to the amendment.

2. *Location and Size. Define the relationship of the affected area to the overall planning area. In most cases, the smaller the area affected by the change, the less likely it is to be significant for the forest plan.* The amendment would affect only a short portion of both Short (550 yards) and Silent (470 yards) Creeks where rotenone would be applied. The 3,031-acre Diamond Lake would also have rotenone applied to it. In relationship to the entire Umpqua National Forest (approximately 1 million acres), the size of the area that I am authorizing to be treated (about 3,032 acres), is less than one percent of the size of the entire Forest and is not of significant size or acreage. While Diamond Lake is an important recreational area, it still represents a small portion of the Umpqua National Forest. Therefore, the location and size of the area involved in the amendment are not considered to be significant.

3. *Goals, Objectives, and Outputs.* Determine whether the change would alter long-term levels of goods and services projected by the forest plan. Currently, both recreational and fishery use of Diamond Lake is lower than what was projected and anticipated in the Forest Plan, due to both the reduction in fishing success because of the presence of tui chub (FEIS pages 398-403), and because of the presence of algae blooms that force short-term lake closures to protect public health and safety (FEIS pages 358-362). The amendment would not change existing goals or outputs as defined by the Forest Plan. Improving water quality and restoring the recreational fishery, which will both be aided by the project-specific amendment, will better meet Forest plan goals and objects than does the current situation. Therefore, the goals, objectives, and outputs are not considered to be a significant factor related to the amendment.

4. *Management Prescription.* Determine whether the change in a management prescription is only for a specific situation or whether it would apply to future decisions throughout the planning area. The amendment would not permanently change management of Diamond Lake, Short Creek or Silent Creek. This amendment applies to this project only; upon completion of the project, Standard and Guideline Fisheries #6, Water Quality/Riparian Areas #8 and Prescription C2-1 would again apply to Diamond Lake, Short and Silent Creeks. Therefore, the change in management prescription is for this project only and is not considered to be a significant factor related to the amendment.

With the enactment of the amendment, the actions in this project comply fully with the goals of the Forest Plan, as amended, including Management Area Direction (LRMP-IV-128 to 136), Standards and Guidelines of the Umpqua National Forest Plan (Chapter IV of the LRMP) and Northwest Forest Plan for Matrix (Attachment A pages C39-21) and riparian reserve land allocations (Attachment A pages C30-38).

## ***Legal Requirements and Policy***

In reviewing the EIS and actions involved in Alternative 5, I have concluded that my decision is consistent with the following laws and requirements:

**The Preservation of American Antiquities Act, June 1906:** The area of potential effects for the Diamond Lake Restoration Project has been inventoried for cultural resource sites. One historic property, the Diamond Lake Fisheries Management Canal, was recorded. Monitoring of the project during and/or after implementation will be completed according to the Standards and Guidelines in the Umpqua National Forest LRMP. The Diamond Lake Fisheries Management Canal shall be restored according to the Secretary of the Interior Standards for Rehabilitation and within the guidelines established in consultation with the Oregon State Historic Preservation Office.

**The National Historic Preservation Act:** The Oregon State Historic Preservation Office (SHPO) has been consulted concerning proposed activities associated with the Diamond Lake Restoration Project. Reports documenting the inventory for the project area and the Diamond Lake Fisheries Management Canal have been submitted to the Oregon State Historic Preservation Office fulfilling the requirements of the 2004 Programmatic

Agreement Among the United States Department of Agriculture Forest Service Pacific Northwest Region (Region 6), the Advisory Council on Historic Resources, and the Oregon State Historic Preservation Officer Regarding Cultural Resource Management in the State of Oregon by the USDA Forest Service. An appropriate inventory was conducted for this undertaking and properties that may be eligible for inclusion in the National Register of Historic Places have been located. The Oregon State Historic Preservation Office concurred with a "No Adverse Effect" finding.

**The National Environmental Policy Act (NEPA), 1969:** NEPA establishes the format and content requirements of environmental analysis and documentation, such as the Diamond Lake Restoration Project. The entire process of preparing an environmental impact statement was undertaken to comply with NEPA.

**The Endangered Species Act of 1973, as amended:** A biological assessment has been prepared to document possible effects of proposed activities on the threatened Northern Spotted Owl and Northern Bald Eagle. As documented above, appropriate coordination and consultation with USFWS has been completed. A biological assessment was also prepared to document the potential effects of proposed activities on the proposed Oregon Coast coho salmon. As documented above, appropriate coordination and consultation with NOAA Fisheries has been completed.

**The National Forest Management Act (NFMA), 1976:** All alternatives were developed to be in full compliance with NFMA.

**The Clean Water Act, 1982:** Alternative 5 will meet and conform to the Clean Water Act in the long-term. Alternative 5 is designed to meet the Act's national goal of restoring fishable, swimmable waters. However, there are several proposed activities that would result in temporary degradation of water quality in Diamond Lake and/or in Lake Creek. As a result, ODEQ will be asked to issue a National Pollutant Discharge Elimination System Permit (NPDES) and/or Section 401 Certification of Water Quality and/or other appropriate waivers for: ODFW's application of chemical piscicide, down stream nutrient effects from the lake draw down, canal dredging and spoil disposal associated with canal reconstruction by the Forest Service, and connected actions that include dredging proposed by the Diamond Lake Resort. Compliance with the conditions identified in ODEQ permits in combination with implementation and monitoring of the site-specific Best Management Practices (BMPs) designed to protect beneficial uses will ensure that legal requirements under the Clean Water Act are met for Alternative 5.

**Satisfaction of State Forest Worker Safety Codes:** The Oregon Occupational Safety and Health Code for Forest Activities (OAR 437, Division 6) regulations will be met when Alternative 5 is implemented. Chemical application strategies are designed to provide for worker safety by incorporating management requirements, mitigation measures, and Best Management Practices that will ensure safe pesticide handling practices, which in turn will ensure that worker safety has been provided for.

**Other Policy or Guiding Documentation:** A Biological Evaluation was prepared to assess potential effects to sensitive species as identified by the Regional Forester. This evaluation determined that while there may be impacts to individual sensitive

species, those effects are not likely to contribute to a trend towards federal listing or loss of viability of the population or species.

## ***Public Participation***

The extensive public-involvement process for the Diamond Lake Restoration Project is documented in detail in Chapter 4 of the FEIS (pgs. 421, 434-436). In the fall of 2002, prior to the initiation of NEPA, the Forest Service and partners in the Diamond Lake Work Group began actively soliciting public participation in the development of the upcoming Diamond Lake Restoration Project. Public forums, presentations to special interest groups, electronic distribution of presentations to interest groups, a technical meeting with actively interested publics, and multiple public mailings were all components of the early public-involvement process. The Confederated Tribes of Siletz, Cow Creek Band of Umpqua Tribe of Indians, and Confederated Tribes of the Grande Ronde were each notified by mail on April 4, 2003 about the upcoming project. No responses were received from the tribes. Concerns and information raised from this early public participation helped the Forest Service to formulate the proposed action for the project.

The NEPA scoping process (40 CFR 1501.7) was subsequently used to invite further public participation, to refine the scope of the project, and to identify preliminary issues to be addressed. The Forest Service sought information, comments, and assistance from Federal, State, and local agencies, the tribes, and other groups and individuals interested in or affected by the Proposed Action. Media coverage of the project was extensive and the public was provided with numerous opportunities to participate in the Diamond Lake Restoration Project during all phases of project development and analysis. The Forest Service continued to hold public meetings and dialogue with interested publics for several months following closure of the formal comment period for the DEIS. Alternative 5 was added to the FEIS and Alternative 4 was modified in the FEIS in response to public comments on the DEIS. Following publication of the FEIS, I held a 14-day "dialogue period" to allow the public an additional chance to voice any lingering concerns regarding the preferred alternative. Clarification was requested regarding the FEIS analysis that included implementation of a contingency plan based on future tui chub reintroductions. We analyzed the effects of a "hypothetical" chub reintroduction occurring in 2011, and displayed the effects for a several-year period. I want to clarify that the contingency plan would go into effect whenever tui chub are illegally or otherwise introduced.

All three tribes were contacted by the Forest tribal liaison during project scoping; the Confederated Tribes of Siletz or the Confederated Tribes of the Grande Ronde provided no input. The Cow Creek Band of Umpqua Tribe of Indians indicated support for the project.

After the Final Environmental Impact Statement was released for public review on November 30, 2004, I offered a public "dialogue period" of fourteen days so that people could "voice any lingering concerns...or ideas for improving the preferred alternative (FEIS transmittal letter)." During that period, I personally contacted Umpqua Watersheds, Northwest Coalition Against Pesticides, Oregon Natural Resource Coalition, and Cascadia Wildlands Project to see if they had concerns or ideas and

asked if they would like to meet for dialogue. I received one request for dialogue through a phone call from an interested person not familiar with the project. Umpqua Watersheds and others provided some written comments that I reviewed prior to completing this Record of Decision.

## ***The Environmentally Preferable Alternative***

In this ROD, I have described the selected alternative and given rationale for its selection. The law also requires that one or more environmentally preferable alternatives be disclosed. Based on regulations, the environmentally preferable alternative is not necessarily the alternative that will be implemented and it does not have to meet the underlying need for the project. It does, however, have to cause the least damage to the biological and physical environment and best protect, preserve, and enhance historical, cultural, and natural resources [Section 101 NEPA; 40 CFR 1505.2(b)].

In the case of the Diamond Lake Restoration Project, I have determined that Alternative 3 is the environmentally preferable alternative. While the Forest Service actions under Alternatives 2, 3, and 5 are the same, I believe that Alternative 3 provides the lowest risk of impacting the recovering zooplankton communities by adhering to a fish stocking strategy that utilizes only larger fish that would not feed on zooplankton.

Alternative 1 is not environmentally preferable because it does nothing to restore Diamond Lake; unacceptable water quality and recreational fishery conditions would continue into the future and I cannot and will not accept those conditions for Diamond Lake. Alternatives 2 and 5 utilize fish stocking strategies that have slightly more risk than Alternative 3, but are still conservative and low risk. I did not choose to implement Alternative 3, my environmentally preferred alternative, or Alternative 2, because those alternatives did not represent the fish-stocking strategy that our partner, ODFW, has indicated it intends to recommend to the Oregon Fish and Wildlife Commission.

I did not choose Alternative 4 as the environmentally preferable alternative because as I have documented and explained earlier, I am simply not confident that this alternative will be successful at restoring lake health to desired levels. Although Alternative 4 does not apply rotenone and would not directly kill gill-breathing aquatic organisms in the lake, the risk of failure associated with this alternative would mean continued algae blooms and water quality problems that may harm people and their pets, and that may be harmful to numerous wildlife species. I am fully aware that all rotenone alternatives (2, 3, and 5) may have greater short-term impacts to the environment than Alternative 4. However, I am also confident that the rotenone alternatives have a much greater likelihood of minimizing severe and continuous long-term impacts to the biological and physical environment; of the rotenone alternatives, Alternative 3 would slightly better protect natural resource values at Diamond Lake.

## ***Mitigation Measures***

Mitigation measures are site-specific management activities designed to reduce the adverse impacts of proposed activities. With this decision under Alternative 5, I have adopted all practical means to avoid or minimize environmental harm through a combination of project-design features, mitigation measures, and monitoring activities. Mitigation measures will be implemented through project design, contract specifications, permit terms, contract and permit administration, and monitoring by Forest Service officers.

As part of my decision, I am choosing to implement the Best Management Practices, management requirements, mitigation measures, and monitoring identified in the EIS (FEIS, pp. 42-50). The vast majority of these measures are within the jurisdictional authority of the Forest Service and are the primary responsibility of the Forest Service. The only exceptions are mitigation measures directly related to the handling and application of rotenone; these are the responsibility of our partner, ODFW. I will insure that these measures are implemented by including them as conditions of our permit to allow transport and storage of rotenone on National Forest System Lands.

I have already identified and discussed the mitigation measures that were most directly applicable in my decision-making process. I am confident that the selected mitigation measures will adequately lessen or prevent adverse effects for the following reasons: the selected mitigation measures are practices we have used successfully in the past; they are State-recognized Best Management Practices for protecting water quality; or they are based on current research or expert recommendations. I have decided to monitor the implementation of these measures and, in some instances, to monitor their effectiveness, as described in the following section.

## ***Monitoring***

Monitoring of the Diamond Lake Restoration Project is designed to accomplish three purposes: 1) to assure that all aspects of the project are implemented as intended; 2) to determine, for certain critical activities, that the effects of the activities are consistent with the intent; and 3) to allow adaptation if it is found that activities are not being implemented correctly or are not having the desired effects. The monitoring elements, along with the mitigation measures and compliance with construction contracts and conditions identified in Forest Service permits represent the enforcement program for this decision. For example, if monitoring of canal reconstruction operations by the Contracting Officer's Representative or Inspector, finds that standards and guidelines, Best Management Practices, mitigating measures, or other contract specifications are not being met; additional measures will be prescribed to insure compliance.

In response to public comments, the partners of the Diamond Lake Work Group drafted a detailed monitoring plan (Appendix BB) to address all aspects of the project. A commitment to monitoring and adaptive management for Diamond Lake is very important to me, to the other Diamond Lake Work Group partners and to the public, thus I chose to include Appendix BB in the body of the FEIS.

In addition to the required monitoring activities described in Chapter 2 of the EIS (FEIS, pp.42-50), some of the monitoring items described in Appendix BB of the FEIS are the primary responsibility of the Forest Service. Other monitoring items are the primary responsibility of our cooperating agencies, ODFW and ODEQ. The responsible party(s) is documented in Table 1 of Appendix BB (Plans 13- 20). All three agencies, the Forest Service, ODFW, and ODEQ, have made a commitment to the public to implement this monitoring plan. Based on this expressed commitment and the legal obligations of each agency, I am confident that monitoring activities which are the responsibility of our cooperating agencies will be completed under Alternative 5. Thus, I will focus only on additional monitoring that is the primary responsibility of the Forest Service.

All of the following monitoring components are considered to be mandatory under this decision, however, if there is not sufficient funding to complete the required activities as described in Appendix BB Table 1, frequency, duration, or design of monitoring would be modified rather than eliminating individual monitoring components. Specific details concerning timeframes, locations and expected duration are included in Appendix BB. The monitoring timeframes documented below assume rotenone treatment will occur in 2006; timeframes will be adjusted if project implementation is delayed.

#### **Required Forest Service Monitoring Not Detailed in FEIS Chapter 2:**

- ❖ **Public Health Water Monitoring:** The waters of Diamond Lake will be monitored for toxic algae in at least one location on a weekly basis from approximately May (ice-off) through September according to the established monitoring protocols. This monitoring is designed to protect the public from exposure to potentially harmful levels of algal toxins. Monitoring will occur annually from 2005-2011.
- ❖ **Diamond Lake Water Quality:** The waters of Diamond Lake will be monitored three to nine times annually from 2005-2011 to assess trends in water quality and thus monitor project effectiveness at meeting the water quality component of the project. Parameters will include pH, Dissolved Oxygen, Chlorophyll-a, Secchi depths, phytoplankton species identification and biovolume, zooplankton, nutrients, and major ions (occasional sampling).
- ❖ **Lemolo Lake and Toketee Lake Water Quality:** The waters of these lakes will be monitored at least one time annually from 2006-2010 to assess trends in water quality and monitor the effectiveness of project design features at minimizing impacts of the draw down and rotenone treatment on down stream water bodies. Parameters will include pH, Dissolved Oxygen, Chlorophyll-a, Secchi depths, phytoplankton species identification and biovolume, zooplankton, nutrients, and major ions (occasional sampling).
- ❖ **North Umpqua River Nutrients:** Nutrient data (nitrogen and phosphorous) will be collected at four stream gauging stations on the North Umpqua River, once in late summer in 2006, 2007, and 2010. This data in combination with data gathered through cooperation with ODFW, ODEQ, and PacifiCorp will be used to monitor the

effectiveness of project design features at minimizing impacts of the draw down and rotenone treatment on down stream water bodies.

- ❖ **North Umpqua River Water Quality and Algal Conditions (Long-term):** Attached algae (periphyton) samples will be collected a minimum of one time in July of 2005 and 2010 at approximately 33 established sites on the North Umpqua River. This data, in combination with data gathered through cooperation with ODEQ and PacifiCorp, will be used to monitor the effectiveness of project design features at minimizing impacts of the draw down and rotenone treatment on down stream water bodies.
- ❖ **Recreational Use Changes:** A visitor use and satisfaction survey will be completed approximately three years following the rotenone treatment (2009) and will be compared to the pre-project survey. This data will be used to monitor the effectiveness of the project at meeting MA-2 goals for recreational opportunities.

Monitoring results collected from the above activities, the activities described in Chapter 2, and the activities that will be completed by cooperating agencies will allow me to assess the overall success of the project at moving Diamond Lake toward the post-project goals described in detail in Chapter 1 of the FEIS (pages 8 and 10).

## ***Consistency with NFMA Requirements***

In all other respects, I find this decision to be consistent with the Umpqua Forest Plan, as amended, and with the requirements of the National Forest Management Act implementing regulations; specifically:

### **Silvicultural Practices**

Alternative 5 includes no timber extraction at all and therefore, does not conduct timber harvest on lands classified as not suited for timber production during forest planning (36 CFR 219.27(c)(1)).

### **Even-aged Management/Clearcutting**

Alternative 5 does not include regeneration harvest or clearcutting; therefore, this NFMA requirement does not apply.

### **Vegetative Manipulation/Management Requirements**

Alternative 5 is consistent with the seven management requirements from 36 CFR 219.27 (resource protection, vegetative manipulation, silvicultural practices, even-aged management, riparian areas, soil and water, and diversity) and the vegetation requirements from 36 CFR 219.27(b).

### **Maintaining Viable Populations of Fish and Wildlife Species**

Alternative 5 is consistent with the viable population requirements of 36 CFR 219.19, as documented in the Fisheries and Wildlife Biological Evaluations and as concurred with by the US Fish and Wildlife Service and NOAA Fisheries.

## **Implementation**

I have reviewed the Diamond Lake Restoration Project FEIS, and its associated appendices. I feel there is adequate information within these documents to provide a reasoned choice of action. I am fully aware of the possible adverse environmental effects that cannot be avoided, and the irretrievable commitment of resources associated with Alternative 5. I have determined that these risks will be outweighed by the likely benefits (FEIS, Chapter 3). Implementing Alternative 5 and authorizing the actions described under it will cause no unacceptable cumulative impact to any resource. There will be no significant impact to cultural resources, consumers, civil rights, minority groups, environmental justice, or women. There are no unusual energy requirements for implementing Alternative 5.

Implementation may occur on, but not before the 15<sup>th</sup> business day following the date of appeal disposition. In the event of multiple appeals, the implementation date will be established following the last appeal disposition (36 CFR 215.9(b)). If no appeal is filed, implementation may begin on, but not before, the 5<sup>th</sup> business day following the close of the appeal-filing period (36 CFR 215.9(a)).

### **Procedure for Changes During Implementation:**

Minor changes may be needed during implementation to better meet on-site resource management and protection objectives. In determining whether and what kind of further NEPA action is required, I will consider the criteria for whether to supplement an existing Environmental Impact Statement in 40 CFR 1502.9(c) and FSH 1909.15, sec. 18; in particular, whether the proposed change is a substantial change to the intent of the selected alternative as planned and already approved, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes regarding particular areas or specific activities will be considered together in making this determination. The cumulative impacts of these changes will also be considered.

## **Appeal Rights**

My decision is subject to administrative appeal (CFR 215.11). Organizations or members of the general public may appeal my decision according to 36 CFR Part 215. The 45-day appeal period begins the day following publication of legal notice of this decision in the Roseburg News Review, the newspaper of record. The Notice of Appeal must be filed with the Appeal Deciding Officer:

